

IN THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the Application:

LISTING OF CLAIMS:

1. (Currently Amended) A pad layout for mounting with a circuit board component, the pad layout comprising:

a set of pads arranged on a surface of a circuit board in a two-dimensional array having at least two pads in a first direction and at least two pads in a second direction that is substantially perpendicular to the first direction, each pad of the set of pads having (i) a central portion and (ii) multiple lobe portions integrated with the central portion and extending from the central portion of that pad;

a solder mask on the surface of the circuit board, the solder mask extending around a periphery of each pad of the set of pads, the solder mask defining a set of apertures, each aperture having (i) a central aperture portion and (ii) multiple lobe aperture portions integrated with the central aperture portion to mirror a profile of a corresponding pad, the solder mask defining clearance regions around each pad of the set of pads;

wherein, for each pad of the set of pads, that pad has exactly four lobe portions that extend from the central portion of that pad;

wherein the circuit board component includes an integrated circuit package and multiple pre-soldered contacts extending from the integrated circuit package; and wherein the set of pads provide multiple metallic surfaces configured to simultaneously solder to the multiple pre-soldered contacts of the circuit board component during a circuit board assembly process involving printing solder paste onto the multiple metallic surfaces, picking and placing the circuit board component onto the solder paste and applying heat; and

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wherein, for each pad of the set of pads, (i) each lobe portion defines a distally disposed edge which is convex ~~relative to a center of that pad~~, (ii) each central portion define central portion edges which are concave ~~relative to the center of that pad~~, (iii) the distally disposed edges and the central portion edges blend smoothly in a manner that is free of sharp angled intersections, and (iv) each concave edge has a radius which is at least twice as large in value as every convex edge.

2. (Cancelled)

3. (Previously Presented) The pad layout of claim 1 wherein, for each pad of the set of pads, two of the four lobe portions of that pad extend along a first axis, and another two of the four lobe portions of that pad extend along a second axis that is substantially perpendicular to the first axis.

4. (Original) The pad layout of claim 1 wherein each pad of the set of pads has a profile having multiple outer radii of substantially 3 mils.

5. (Original) The pad layout of claim 4 wherein the profile of each pad of the set of pads further has multiple concave radii of substantially 8 mils.

6. (Cancelled)

7. (Previously Presented) The pad layout of claim 1 wherein the solder mask defines clearance regions that are substantially 2 mils wide around each pad of the set of pads.

8. (Original) The pad layout of claim 1 wherein each pad of the set of pads substantially has:

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a first length along a first axis and the first length along a second axis that is substantially perpendicular to the first axis, and
a second length along a third axis and the second length along a fourth axis that is substantially perpendicular to the third axis; and
wherein the second length is greater than the first length.

9. (Original) The pad layout of claim 8 wherein the first and second axes are pivoted from the third and fourth axes by substantially 45 degrees.

10. (Original) The pad layout of claim 8 wherein the first length is substantially 18 mils and the second length is substantially 24 mils.

11. (Currently Amended) A circuit board, comprising:

a set of circuit board layers combined to form a rigid planar structure having an outer surface; and

a pad layout configured to mount with a circuit board component, the pad layout including a set of pads arranged on the surface of a circuit board in a two-dimensional array having at least two pads in a first direction and at least two pads in a second direction that is substantially perpendicular to the first direction, each pad of the set of pads having (i) a central portion and (ii) multiple lobe portions integrated with the central portion and extending from the central portion of that pad;

a solder mask on the surface of the circuit board, the solder mask extending around a periphery of each pad of the set of pads, the solder mask defining a set of apertures, each aperture having (i) a central aperture portion and (ii) multiple lobe aperture portions integrated with the central aperture portion to mirror a profile of a corresponding pad, the solder mask defining clearance regions around each pad of the set of pads;

wherein, for each pad of the set of pads, that pad has exactly four lobe portions that extend from the central portion of that pad, two of the four lobe portions of that pad extending along a first axis, and another two of the four lobe portions of that pad extending along a second axis that is substantially perpendicular to the first axis;

wherein the circuit board component includes an integrated circuit package and multiple pre-soldered contacts extending from the integrated circuit package; and wherein the set of pads provide multiple metallic surfaces configured to simultaneously solder to the multiple pre-soldered contacts of the circuit board component during a circuit board assembly process involving printing solder paste onto the multiple metallic surfaces, picking and placing the circuit board component onto the solder paste and applying heat; and

wherein, for each pad of the set of pads, (i) each lobe portion defines a distally disposed edge which is convex ~~relative to a center of that pad~~, (ii) each central portion define central portion edges which are concave ~~relative to the center of that pad~~, (iii) the distally disposed edges and the central portion edges blend smoothly in a manner that is free of sharp angled intersections, and (iv) each concave edge has a radius which is at least twice as large in value as a radius of every convex edge.

12. (Cancelled)

13. (Original) The circuit board of claim 11 wherein each pad of the set of pads has a profile having multiple outer radii of substantially 3 mils, and multiple concave radii of substantially 8 mils.

14. (Previously Presented) The circuit board of claim 11, the solder mask defining clearance regions that are substantially 2 mils wide around each pad of the set of pads.

15. (Original) The circuit board of claim 11 wherein each pad of the set of pads substantially has:

a first length along a first axis and the first length along a second axis that is substantially perpendicular to the first axis, and

a second length along a third axis and the second length along a fourth axis that is substantially perpendicular to the third axis; and

wherein the first and second axes are pivoted from the third and fourth axes by substantially 45 degrees, wherein the first length is substantially 18 mils, and wherein the second length is substantially 24 mils.

16. (Currently Amended) A circuit board assembly, comprising:

a set of circuit board layers combined to form a rigid planar structure having an outer surface;

a pad layout including a set of pads arranged on the surface of a circuit board in a two-dimensional array having at least two pads in a first direction and at least two pads in a second direction that is substantially perpendicular to the first direction, each pad of the set of pads having (i) a central portion and (ii) multiple lobe portions integrated with the central portion and extending from the central portion of that pad;

a solder mask on the surface of the circuit board, the solder mask extending around a periphery of each pad of the set of pads, the solder mask defining a set of apertures, each aperture having (i) a central aperture portion and (ii) multiple lobe aperture portions integrated with the central aperture portion to mirror a profile of a corresponding pad, the solder mask defining clearance regions around each pad of the set of pads;

a circuit board component mounted to the pad layout via a set of solder joints;

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wherein, for each pad of the set of pads, that pad has exactly four lobe portions that extend from the central portion of that pad;

wherein the circuit board component includes an integrated circuit package and multiple pre-soldered contacts extending from the integrated circuit package; and wherein the set of pads provide multiple metallic surfaces configured to simultaneously solder to the multiple pre-soldered contacts of the circuit board component during a circuit board assembly process involving printing solder paste onto the multiple metallic surfaces, picking and placing the circuit board component onto the solder paste and applying heat; and

wherein, for each pad of the set of pads, (i) each lobe portion defines a distally disposed edge which is convex ~~relative to a center of that pad~~, (ii) each central portion define central portion edges which are concave ~~relative to the center of that pad~~, (iii) the distally disposed edges and the central portion edges blend smoothly in a manner that is free of sharp angled intersections, and (iv) each concave edge has a radius which is at least twice as large in value as a radius of every convex edge.

17. (Original) The circuit board assembly of claim 16 wherein the circuit board component includes a ceramic column grid array package having a set of column-shaped contacts corresponding to the set of pads.

18. (Original) The circuit board assembly of claim 16 wherein the circuit board component includes a ball grid array package having a set of ball-shaped contacts corresponding to the set of pads.

19. (Currently Amended) A circuit board assembly, comprising:

a set of circuit board layers combined to form a rigid planar structure having an outer surface;

a pad layout including a set of pads arranged on the surface of a circuit board in a two-dimensional array having at least two pads in a first direction and

at least two pads in a second direction that is substantially perpendicular to the first direction, each pad of the set of pads having (i) a central portion and (ii) multiple lobe portions integrated with the central portion and extending from the central portion of that pad;

a solder mask on the surface of the circuit board, the solder mask extending around a periphery of each pad of the set of pads, the solder mask defining a set of apertures, each aperture having (i) a central aperture portion and (ii) multiple lobe aperture portions integrated with the central aperture portion to mirror a profile of a corresponding pad, the solder mask defining clearance regions around each pad of the set of pads;

a circuit board component;

means for mounting the circuit board component to the set of pads of the pad layout;

wherein, for each pad of the set of pads, that pad has exactly four lobe portions that extend from the central portion of that pad;

wherein the circuit board component includes an integrated circuit package and multiple pre-soldered contacts extending from the integrated circuit package; and wherein the set of pads provide multiple metallic surfaces configured to simultaneously solder to the multiple pre-soldered contacts of the circuit board component during a circuit board assembly process involving printing solder paste onto the multiple metallic surfaces, picking and placing the circuit board component onto the solder paste and applying heat; and

wherein, for each pad of the set of pads, (i) each lobe portion defines a distally disposed edge which is convex ~~relative to a center of that pad~~, (ii) each central portion define central portion edges which are concave ~~relative to the center of that pad~~, (iii) the distally disposed edges and the central portion edges blend smoothly in a manner that is free of sharp angled intersections, and (iv) each concave edge has a radius which is at least twice as large in value as a radius of every convex edge.

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Claims 20-32. (Canceled)